Slowing the Spread
Virginia Containment Strategy for Carbapenemase-Producing Organisms (CPOs)

Approach to Contain CPOs

The public health response includes:

- Ensuring appropriate prevention measures are implemented
- Identifying affected patients
- Determining if transmission and dissemination are occurring
- Performing additional laboratory tests to guide current and future response actions and patient management

Disease reporting and isolate submission of the following is required by state law:

Report to your local health department (LHD)	Submit these isolates to the Division of Consolidated Laboratory Services (DCLS)	
Carbapenemase-producing organisms (CPOs)	Carbapenem-resistant Enterobacteriaceae (CRE)	Carbapenem-resistant *Pseudomonas* spp.

More information on reporting and isolate submission requirements can be found on the VDH HAI/AR Reporting webpage

Response activities have a tiered approach based on resistance mechanism attributes:

	CDC Definition	Applicable Organisms in Virginia
Tier 1	• Organisms and resistance mechanisms novel to the U.S., **OR** • Organisms for which no current treatment options exist (pan-resistant) and that have the potential to spread more widely within a region	• Novel carbapenemase resistance mechanism • Pan-resistant CPOs
Tier 2	• MDROs primarily found in healthcare settings but not found regularly in the region; Organisms might be found more commonly in other areas in the	• Carbapenemase-producing CRE (CP-CRE) caused by NDM, VIM, IMP, or OXA • Carbapenemase-producing carbapenem-resistant Pseudomonas aeruginosa • (CP-CRPA) caused by KPC, NDM, VIM, IMP, or OXA
Tier 3	• MDROs that are already established in the U.S. and have been identified before in the region but are not thought to be endemic	• CP-CRE cause by KPC

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Containment Strategy Elements

VDH follows the CDC Containment Strategy Guidelines. For CPOs this includes:

1. Healthcare investigation

- For Tier 1 and Tier 2 organisms, LHD will investigate healthcare exposures of the index-case over the preceding month and up to 3 months
- For Tier 3, LHD staff will investigate current healthcare exposure and potentially exposure prior to admission up to the preceding one month
- Healthcare facilities that previously cared for the index patient or other confirmed cases will be notified so that they can "flag" the patient's record and initiate appropriate infection prevention precautions upon re-admission

2. Prospective lab surveillance

- Clinical laboratories that performed cultures from healthcare settings that the index-case has been exposed to in the past 3 months should conduct prospective surveillance in order to identify organisms with similar resistance patterns from clinical cultures

3. Retrospective lab surveillance

- Clinical laboratories should perform a one-time retrospective review (6-12 months) of results to identify organisms with similar resistance patterns. If available, the specimen should be sent to DCLS

4. Onsite infection control assessment with observation of practices

- When a Tier 1 or Tier 2 organism is identified, health departments or other experts should conduct on-site visits to facilities and use a standardized assessment tool to evaluate infection control practices at facilities that have cared for the index-case
- When a Tier 3 organism is identified and there is confirmed or suspected transmission, health departments or other experts should consider conducting on-site visits to evaluate infection control practices
- Assessments should include observations of infection control practices and recommendations to address observed gaps. VDH uses the APIC and CDC developed QUOTs when observing practices
- Repeat on-site assessments might be needed to ensure that infection control gaps are fully addressed

5. Colonization Screening of healthcare contacts

Screening of healthcare roommates

- For Tier 1 and Tier 2 organisms, roommates and patients that shared a bathroom with the index-case should be identified and cultured even if they have been discharged from the facility
- For Tier 3 organisms, roommates and patients that shared a bathroom with the index case should be identified and cultured if they are still admitted

Broader screening of healthcare contacts

- If the index-case was not on contact precautions during their entire stay OR the index-case was on contact precautions but adherence to contact precautions is low OR the index-case was on contact precautions but is high-risk for transmission (e.g., bedbound, has invasive medical devices, incontinent of stool or urine, etc.):
  - Screen healthcare contacts who are still admitted, AND overlapped with the index-case, AND who have a risk factor for MDRO acquisition (e.g., being bedbound or requiring higher levels of care, being on antibiotics, or being on mechanical ventilation or having other invasive medical devices)
  - Alternatively, facilities may choose to screen entire units using point prevalence surveys
- If the index-case was on contact precautions during their entire stay (and adherence is high) at the facility, AND the index-patient is not high-risk for transmission:
  - Screening beyond healthcare roommates is generally not recommended

Facilities should contact the local health department as soon as they have identified a patient that matches the above criteria.

Colonization supplies are available at no charge through the AR Lab Network

6. Household contact screening

- Applicable only for novel carbapenemase mechanisms
- May apply to pan-resistant CPO cases if household contact has extensive healthcare exposure
- Would include close household contacts (e.g., contacts who help care for the index-case or share a bed or bathroom with the patient)

7. Environmental sampling

- Not applicable except for Tier 1 organisms for situations in which questions about the effectiveness of terminal cleaning exist

8. Healthcare personnel (HCP) screening

- Cultures of HCP might be recommended for a novel carbapenemase mechanism depending on if the HCP had extensive contact with the index-case and if epidemiology suggests the organism may have spread

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Containment Strategy Recommendations

	Novel Carbapenemase Mechanism	Pan-resistant CPO	CP-CRPA (IMP, KPC, NDM, OXA, VIM)	CP-CRE (IMP, NDM, OXA, VIM)	CP-CRE (KPC)
Healthcare investigation	**Always**	**Always**	**Always**	**Always**	**Always**
Prospective surveillance	**Always**	**Always**	**Always**	**Always**	**Always**
Retrospective lab surveillance	**Always**	**Always**	**Always**	**Always**	**Sometimes**
Onsite Infection Control Assessment with observations of practices	**Always**	**Always**	**Always**	**Always**	**Sometimes**
Screening of healthcare roommates	**Always**	**Always**	**Always**	**Always**	**Always**
Broader screening of healthcare contacts	**Always**	**Sometimes**	**Sometimes**	**Sometimes**	**Sometimes**
Household contact screening	**Always**	**Sometimes**	**Rarely**	**Rarely**	**Rarely**
Environmental sampling	**Sometimes**	**Rarely**	**Rarely**	**Rarely**	**Rarely**
Healthcare personnel screening	**Sometimes**	**Rarely**	**Rarely**	**Rarely**	**Rarely**

Roles and Responsibilities to Contain CPOs

Healthcare Facilities

- Plan for unusual resistance arriving at your facility
- **Leadership**: Work with health department to stop spread of unusual resistance. Review and support infection prevention in the facility
- **Clinical labs**: Know what isolates to send for testing. Establish protocols that immediately notify health department, health care provider, and infection prevention staff of unusual resistance
- **Healthcare providers, epidemiologists, and infection prevention staff**: Place patients with unusual resistance on contact precautions, assess and enhance infection prevention, and work with the health department to screen others. Communicate about patient status if transferred. Continue infection control assessments and colonization screenings until spread is controlled. Ask about any recent travel or healthcare for at-risk patients

State and Local Health Departments

- Educate healthcare facilities on state and local lab resources
- Develop a plan to respond rapidly to unusual resistance genes
- Coordinate with affected healthcare facilities, the Antimicrobial Resistance (AR) Lab Network, and CDC for every case of unusual resistance
- Provide timely lab results and recommendations to affected health care facilities and providers

Everyone

- Inform healthcare provider if you recently received healthcare in another country or facility
- Practice good hand hygiene
- Talk to your health care provider about preventing infections

For more information visit:

CDC Containment Strategy | CDC Guidance for Control of CRE | VDH CRO Website

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